



العنوان باللغة العربية

أثر دمج التنمية البيئية المستدامة في ممارسات إدارة المشاريع لشركات القطاع الخاص في المملكة العربية السعودية
على الأثر البيئي

الإعداد:

أسماء عبدالعال (القائد) – 221000485

جاسم النامي (عضو) _ 221001606

جاسم السقيط (عضو) _ 20222005600

الإشراف:

د. وليد سليمان

العام الدراسي:

الفصل الدراسي الثاني لعام 2023

Contents List of

List of tables and figures	3
List of tables	3
List of supplements	4
Part One :Abstract:	4
الملخص باللغة العربية:.....	5
Part Two: The theoretical framework of the study	6
Introduction:	6
Research problem	8
Research importance	8
Research aims	9
Research questions	9
Research assumes	10
Literature review and previous studies	10
Research Methodology	12
Research structure	13
Search limitations	13
The variables of the study	14
Background	14
Independent variable: sustainable environmental development	16
The concept of sustainable environmental development	16
The environmental dimension of sustainable development	18
Part Three:.....	24
The practical study and its methodological procedures	24
Study Approach	25
Study limits	25
Study community	25
The study sample	25
Authenticity of the content	25
Analyze and present the results of the study	26
Characteristics of the demographic sample	26
Check the study hypotheses.....	38

Conclusion.....	43
Recommendations	44
Part Four:.....	46
Study Appendices.....	46
References.....	47
Questionnaire	52

List of tables and figures

list of figures	page number
Figure a. Three main dimensions of sustainability	7
Figure b. Pillars of Saudi Vision 2030	8
Figure 1: Age	27
Figure 2: Occupation	29
Figure 3: Industry	31
Figure 4: Location	32
Figure 5: Company Size	34
Figure 6: Environmental awareness	36
Figure 7: Environmental concerns	38

List of tables

List of tables	page number
Table a: Summary of previous studies	11
Table 1: Age	27
Table:2 Occupation	28
Table:3 Industry	30
Table:4 Location	32
table:5 Company size	34

Table:6 Environmental awareness	35
Table:7 Environmental concerns	37
Table:8 Education level	39
Table:9 Number of Audit	42
Table:10 Objectives toward Sustainability	43
Table:11 Education level	40

List of supplements

figures	page number
Figure1: Ambient sulfur dioxide concentration trend in major Saudi Arabian cities.	49
Figure 2. Ambient oxides of nitrogen concentration trend in major Saudi Arabian cities	50
Figure 3. Saudi Arabia's historical timeline of CO2 emissions by sector.	50
Figure 4. Saudi Arabia's annual CO2 emissions trends from 1990 to 2020.	51
Figure 5. Year-on-year deltas of total CO2 emissions (in a million tons) for the Middle East (including Saudi Arabia).	52
Figure 6. Year-on-year percentage change for Saudi Arabia's CO2 emissions drivers comprising the Kaya Identity.	52

Part One :Abstract:

The proposed study seeks to ensure that the private sector maintains its pace in a sustainable manner, creating a balance between economic growth, environmental care and social welfare. Saudi Arabia offers a country with an opportunity to lead by example within its Vision 2030. However, deteriorating air quality, industrial pollution, waste management and pollution; and the subsequent

stress on marine ecosystems are all major environmental challenges facing manufacturing companies in Saudi Arabia. For effective protection of the environment, a multidisciplinary approach within a sustainable framework is required, integrating human needs with economic development and environmental protection.

The research addresses a problem of lack of understanding by manufacturing companies in the Kingdom on how to integrate sustainable environmental development into their project management practices. Many projects in the private sector companies still use non-environmentally friendly equipment and raw materials and do not care about environmental impact assessment.

The reason for this research was to provide an overview of the main environmental problems and challenges in project management for private sector companies in Saudi Arabia and provide opportunities to use economic growth, social justice and environmental protection as interrelated components.

The study concluded with a set of results, including acknowledging the importance of proper application of environmental management mechanisms on all projects, especially those associated with private sector companies, so that we can reduce the harmful effects of pollutants emitted by those companies. And the importance of believing in the goals of sustainable development and achieving its principles, in order to preserve the legacy of future generations and guide the use of our resources in the hope of protecting the survival and continuity of living organisms, including humans.

Keywords: private sector companies, environmental impact, Saudi Arabia, sustainable environmental development, project management, carbon emissions, and pollution.

الملخص باللغة العربية:

تسعى الدراسة المطروحة في التأكد من أن القطاع الخاص يحافظ على وتيرته بطريقة مستدامة، مما يخلق توازنًا بين النمو الاقتصادي والرعاية البيئية والرفاهية الاجتماعية. تعرض المملكة العربية السعودية دولة لديها فرصة لتكون قدوة يحتذى بها ضمن رؤيتها 2030. ولكن رغم هذا يعد تدهور جودة الهواء والتلوث الصناعي وإدارة النفايات والتلوث؛ والإجهاد اللاحق على النظم البيئية البحرية كلها تحديات بيئية رئيسية تواجه شركات التصنيع في المملكة العربية السعودية. من أجل الحماية الفعالة للبيئة، يلزم اتباع نهج متعدد التخصصات ضمن إطار مستدام، يدمج الاحتياجات البشرية مع التنمية الاقتصادية وحماية البيئة.

يعالج البحث مشكلة نقص في فهم شركات التصنيع في المملكة حول كيفية دمج التنمية البيئية المستدامة في ممارسات إدارة المشاريع الخاصة بهم. وما زالت كثير من المشروعات في شركات القطاع الخاص تستخدم معدات وخامات غير صديقة للبيئة ولا تهتم بتقييم الآثار البيئية.

وكان سبب هذا البحث تقديم لمحة عامة عن المشاكل والتحديات البيئية الرئيسية في إدارة المشاريع لشركات القطاع الخاص في المملكة العربية السعودية وتوفير فرصاً لاستخدام النمو الاقتصادي والعدالة الاجتماعية وحماية البيئة كمكونات مترابطة.

خلصت الدراسة الى مجموعة من النتائج كان منها الاقرار بأهمية التطبيق السليم لآليات الإدارة البيئية على كل المشروعات خاصة المرتبطة بشركات القطاع الخاص، حتى تتمكن من تخفيض الآثار الضارة للملوثات الصادرة عن تلك الشركات. وأهمية الإيمان بأهداف التنمية المستدامة وتحقيق مبادئها، لكي نحافظ على إرث الأجيال القادمة ونرشد استخدام مواردنا أملاً في حماية بقاء واستمرار الكائنات الحية متضمنة الإنسان.

الكلمات المفتاحية: شركات القطاع الخاص، الأثر البيئي، المملكة العربية السعودية، التنمية البيئية المستدامة، إدارة المشاريع، انبعاثات الكربون، التلوث.

Part Two: The theoretical framework of the study

Introduction:

The world is witnessing an increasing interest in sustainable development reports, hoping to improve its dimensions represented in the economic dimension, the social dimension, and the environmental dimension. Interest in sustainable development emerged at the end of the twentieth century through the holding of many international conferences to discuss areas of scientific development to determine how developed countries can contribute to achieving the goals. Sustainable Development. (Doru. 2015)



Figure a. Three main dimensions of sustainability

As the environmental dimension is considered an integral part of sustainable development, mechanisms must be put in place to study, plan and review programs by those in charge of them and try to find out the reasons for failure to complete them. Ensures long-term development (**Mohamed, 2010**)

Development is the goal to achieve the aspirations and goals of society, and if development is one of the necessities of contemporary societies, then it is a basic requirement for developing societies. To cause many damages because of the uses and depletion of available resources.

Many countries, especially developing countries, face many environmental crises and accidents that negatively affect the life of living organisms on this planet. If current generations do not pay attention to environmental management and adopt the concepts of sustainable development and green environment, it will oppress future generations and leave them a ruined legacy. (**Ashraf Mohamed. 2013**) And after the discovery of oil in Saudi Arabia, petroleum became an essential industry. The economy of Saudi Arabia has been growing and has been developing at a rapid pace since the 1980s, supported by huge revenues from oil exports. Despite the backwardness in the past, Saudi Arabia's wealth of resources has led to a number of development initiatives that modernized the country and contributed to a decrease in the unemployment rate (**Mahmoud, Al-Khatib, Al-Furqan, 2020.**). Gasoline prices in the Saudi market dropped dramatically between 2018 and 2020, forcing Saudi Arabia to set its strategy for 2030. Vision 2030 aspires to transform Saudi Arabia into an exemplary sustainable society by reducing its dependence on petroleum, building more

sustainable structures, and using Renewable energy resources. In designing an ideal sustainable society, equal access to food, health care, clean water, shelter, education, energy, economic opportunity, and jobs should be provided (**Mostadam Green Building Rating System, 2020**).



Figure b. Pillars of Saudi Vision 2030

Saudi Arabia is home to a number of projects for private sector companies committed to sustainability. However, more research is still needed on the impact of incorporating environmental sustainable development into project management practices. This study will investigate the impact of integrating sustainable environmental development into the project management practices of private sector companies in the Kingdom of Saudi Arabia on environmental impact.

Research problem

There is a lack of understanding by private sector companies in the Kingdom of how to incorporate sustainable environmental development into their project management practices. Many projects in the private sector companies still use equipment and raw materials that are not environmentally friendly and do not care about environmental impact assessment, which was confirmed by the survey conducted by researchers for a number of these companies, which leads to the deterioration of the environmental situation.

Research importance

The importance of the research is highlighted as follows:

1. First, it is necessary to protect the environment and ensure a sustainable future for the region. The project management in the private sector companies, which is a major source of pollution in Saudi Arabia, must take effective practices and the sector is responsible for a large part of the region's carbon emissions, water consumption, and electricity generation. Waste. By incorporating sustainable practices into the management of their projects, companies can reduce their environmental impact and help protect the environment.
2. Second, the research can help identify best practices for integrating environmental sustainable development into project management. Other companies in the region to reduce their environmental impact and improve their sustainability performance can then use this information.

Research aims

The research aims to know the impact of integrating sustainable environmental development into the project management practices of private sector companies in the Kingdom of Saudi Arabia on the environmental impact and making some recommendations and proposals with the aim of improving sustainable environmental development in project management in those facilities.

Research questions

Based on the research problem, the research questions can be formulated as follows:

What is the impact of incorporating sustainable environmental development into the project management practices of private sector companies from Saudi Arabia on environmental impact?

A set of sub-questions branch out from this main question:

- How do private sector companies in Saudi Arabia incorporate sustainable environmental development into their project management practices?
- What are the environmental impacts of private sector companies in Saudi Arabia?

- How do the environmental impacts of private sector companies in Saudi Arabia change when incorporating sustainable environmental development into their project management practices?
- What are the challenges and opportunities for private sector companies in Saudi Arabia to integrate sustainable environmental development into their project management practices?

Research assumes

The general hypotheses of the study can be formulated as follows:

Hypothesis 1: The education level of employees shapes the awareness toward environment.

Hypothesis 2: The number of complains from different stockholders decrease with the increase of environmental sustainability audit.

Hypothesis 3: The environmental sustainability objectives and goals change depending on the type of industries

Literature review and previous studies

What distinguishes the industry more than other economic sectors; it is its high contribution to achieving economic development and its general objectives, and therefore economic regression and underdevelopment must be overcome, especially for developing countries, through diversifying sources of income and optimal use of local resources to build a strong and balanced economy and expand the production base (Gunal, 2019). Industrial zones represent an important part it is part of the economic strategy in many countries, especially in developed countries, where the planning and promotion of these areas plays an essential role in urban planning (Khababa, 2019).

The literature indicates that there is a lack of research on the impact of integrating sustainable environmental development into project management practices for private sector companies in Saudi Arabia on environmental impact, and the scarcity of information related to this relationship between

project management for private sector companies and sustainability performance only reveals the need for further research in this field.

In this regard, the novelty of this study is to explore the relationship between private sector companies and the performance of sustainable environmental development in the Kingdom of Saudi Arabia. In addition, this study provides new insight into the impact of incorporating sustainable environmental development into the project management practices of private sector companies in Saudi Arabia on environmental impact. In addition, it highlights the managerial implications and theoretical contributions of private sector firms. Where the study (Ahed and Yousry, 2016) dealt with the role of environmental auditing in achieving sustainable development in business establishments, by addressing previous studies related to environmental auditing for sustainable development purposes, and the intellectual framework of environmental auditing and sustainable development. The study concluded that there are problems related to environmental pollution. Climate change, debt and poverty limit the achievement of sustainable development goals. The study also found a low commitment to laws, legislation, regulations and internal regulations, and poor disclosure of environmental performance for the purposes of sustainable development by business establishments.

Table a: Summary of previous studies

<i>Study name</i>	<i>Author</i>	<i>Results</i>
<i>The Concept of Sustainable Development: From its Beginning to the Contemporary Issues</i>	(Klarin, 2018)	The study emphasized that sustainable development must provide a solution in terms of meeting basic human needs, integrating and protecting environmental development, achieving equality, ensuring social self-determination and cultural diversity, and preserving environmental integrity.
<i>A History of The Concept of Sustainable Development: Literature Review</i>	(Paul , 2018)	The study concluded that the greatest challenge to sustainable development remains the global awareness regarding the importance of facing the challenges of the industrial revolution and the unlimited human and environmental exploitation of limited environmental resources.

<i>An Introduction to the Concept of Environmental Management: Indian Context</i>	(Kumar Das , 2016)	The study showed that economic development without environmental considerations causes an environmental crisis, as it reduces the quality of life of the current generation as well as the future generation, and since more companies in the global market, especially in India, are becoming concerned about environmental degradation, it is natural that more and more focus is placed on environmentally friendly outputs.
<i>Environmental management of urban development</i>	(Al-Fiqi. 2018)	The research reviews the development of environmental awareness in the management of urban construction and the environmental problems that civilization faces today, with a historical presentation of international treaties and conventions related to the environment, and exposure to the concept of environmental management and its challenges, with a presentation of the considerations that must be taken into account to find effective management of the environment in urban construction.
<i>Environmental management, the new face of environmental responsibility in Algerian industrial organizations: a field study.</i>	(Shufa. 2017)	This study attempts to shed light on the environmental management system, and a major direction has been given to industrial companies in the embodiment of environmental responsibility, from the hypothesis that the application of the environmental management system is an important step towards protecting the environment.

Research Methodology

The quantitative method was used in the research, as this methodology will include a survey of some private sector companies in the Kingdom of Saudi Arabia. The survey will collect data on the use of sustainable environmental development practices in their project management practices. Qualitative

methods will include interviews with project managers. The interviews will be used to gain insight into the challenges and opportunities of integrating sustainable environmental development into project management.

The research will be conducted in three stages:

- Phase 1: A literature review will be conducted to identify key sustainable environmental development practices that can be incorporated into project management.
- Phase Two: The survey will be conducted to collect data on the use of sustainable environmental development practices, and project management practices of private sector companies in the Kingdom.
- Phase 3: In-depth interviews will be conducted with project managers.

Research structure

This study is divided into four chapters as follows:

- Part One: Abstract .
- Part Two: The theoretical framework of the study.
- Part Three: The practical study and its methodological procedures.
- Part Four: Study Appendices & References.

Search limitations

The difficulty of measuring different environmental impacts may be one of the determinants of studying the impact of environmental sustainability in project management for private sector companies in the Kingdom of Saudi Arabia. For example, it can be difficult to accurately measure the carbon emissions associated with different manufacturing processes or to compare the environmental impacts of different supply chains.

Another limitation may be the lack of standardized metrics or guidelines for measuring environmental impacts. Without standardized metrics or guidelines, it can be difficult to compare the

environmental impacts of different manufacturing processes or accurately measure progress toward environmental sustainability goals.

Finally, a limitation could be the lack of awareness or endorsement from key stakeholders. Without the support of senior management or other key stakeholders, it may be difficult to implement environmental sustainability initiatives or make significant progress toward environmental sustainability goals.

The variables of the study

Background

Human emission of greenhouse gases (GHGs) is one of the most significant threats to the world's ecosystem. Economic expansion and increasing industrialization in emerging economies has encouraged the uncontrolled use of fossil fuel energy. Coupled with the rapid depletion of natural resources, this circumstance has led to an increase in environmental waste, tailings, and greenhouse gases (**Jiang et al., 2022**). Policy makers and academics argue that anthropogenic emissions play an important role in promoting climate change, increasing temperature and air pollution. The model of economic success in many developing countries has traditionally relied on fossil fuels and hydrocarbons as energy sources that cause anthropogenic carbon dioxide emissions. **Nair et al. (2021)** the primary source of greenhouse gas emissions is documented to be the combustion of fossil fuels. For example, 80% of the world's energy is used in the exploitation of natural resources, which accounts for half of the world's carbon dioxide emissions and 90% of biodiversity loss due to the extraction of these resources.

After the prominent results of overuse of fossil fuels and carbon emissions on the quality of the environment, the current study aims to improve the role of manufacturing companies in the Kingdom of Saudi Arabia and achieve the goal of sustainable environmental development through specific results and policies. The Kingdom of Saudi Arabia is characterized by economic characteristics such as abundant rents of natural resources, increased economic and financial growth and development, as well as high development and use of energy, which determine the level of sustainable development in the country. These features are essential for both economic and

environmental development in Saudi Arabia. The sustainable development of any country depends on the effective implementation of its economic activities amidst the listed economic indicators (resource rent, economic growth, financial development and energy use) while controlling the external factors capable of endangering economic or environmental development. Economic and financial development that involves excessive use of fossil fuels and inhibits the development of renewable energy sources is detrimental to environmental development and can hinder overall sustainable development. The activities of the industry, energy, construction and transportation sectors in Saudi Arabia are mainly carried out using fossil fuels, which leads to carbon emission. This indicates that economic growth and development in the Kingdom of Saudi Arabia is highly

dependent on the use of energy sources from fossil fuels. According to the European Union Joint Research Center (**M.A. Alsaedi et al. 2022**) is 588.81 metric tons, which places the country in the ninth position among the ten most carbon emitters in the world.

With its impact on the lives of billions of people, environmental pollution has been the primary target of research worldwide. The release of one billion metric tons of carbon dioxide into the atmosphere has been linked to the death of 226,000 people worldwide, according to a recent study by Bressler (2021). Similarly, the World Health Organization (2017) estimates that between 2030 and 2050, deaths from the severe consequences of climate change could increase to approximately 250,000 (**Kuldasheva and Salahodjaev, 2022**). However, many economies attempted to put an end to it through energy policies in the aftermath of the 2015 Paris Climate Agreement (**Ding et al., 2021**). As a result, policymakers and academics have been pushing for the use of renewable energy as it has been shown to reduce carbon emissions. According to ecologists and economists, in energy policy, increasing the use of renewable energy is a key goal in achieving the sustainable development goals for both developing and industrialized countries. Many researchers also document that renewable energy resources improve environmental quality, boost economic growth and create jobs, among others (**Fernando et al. 2018**).

Moreover, the contribution of financial development to economic growth and energy efficiency is critical. A well-functioning financial system helps economic growth and development, which in turn improves the overall efficiency of the financial system. While the importance of energy has been emphasized as it plays a vital role in promoting economic growth, its shortcomings with regard to

environmental degradation cannot be ignored. Moreover, energy consumption accompanies an influx of financial resources, and an additional cost is required for manufacturing, which attempts to improve energy efficiency, thus stimulating the use of improved technologies to support economic growth. Financial development has evolved as a critical factor for economic growth (**T.S. Adebayo et al. 2021**). Financial development boosts the economy. However, it also has negative effects on the environment and depletes natural resources in different ways. In particular, financial growth enables people to buy more homes, machinery, cars, and electronics, raising concerns about the environment by increasing energy demand.

Therefore, this chapter will attempt to focus on the concept of sustainable environmental development in the Kingdom of Saudi Arabia and the role played by project management practices in private sector companies.

Independent variable: sustainable environmental development

The concept of sustainable environmental development

The concept of sustainable development came as an alternative to previous development concepts. The concept of sustainable development emerged after the exacerbation of environmental problems and the subsequent collision of governments with human rights associations, environmental protection associations and other civil society parties, as their demands were to preserve resources for future generations and reduce pollution and the resulting pollution. Destruction of nature (**Shanavi and Khouni, 2020**)

Qalqil (2018) mentioned in his research on city governance and sustainable development that Brundtland's definition of development is the most well-known definition. He defined it as: the ability to meet the needs at the present time without negatively affecting the ability of future generations to meet their needs, and he also defined it as an interaction process between three Systems: ecological system, economic system, social system.

While the United Nations defined sustainable development as being able to meet the needs of those present and compromise to meet the needs of future generations (**Damas, 2020**).

While the World Bank defined it as development that is concerned with creating related parity, meaning that future generations will have the same opportunities as current generations, by ensuring comprehensive capital or continuous increase over time **(Al-Tamimi, 2020)**.

UNESCO defines sustainable development as the responsibility of each generation to enjoy natural resources and leave them pure and unpolluted for future generations **(Damas, 2020)**.

From the foregoing, we can derive a comprehensive definition of sustainable development as a continuous process over time that seeks to force the current inhabitants of the earth to conserve the natural resources available to them and not to waste or pollute them, and to urge them to use productive energy efficiently, in order to ensure that future generations get what they deserve from a livable environment and abundant resources that enable them to Living in luxury in any area on the face of this earth **(Rahim and Jabbar. 2020)** .

In order to achieve sustainable development, a set of principles and foundations have been established that must be followed. Among these principles are the following **(Wada'i and Buabibia, 2015)**:

- Long-term vision: The sustainable development plan is based on a long-term vision, which is within an extended period to reach the desired goals.
- Interdependence: Sustainable development has three clear and interrelated dimensions that revolve between the economic, environmental and social dimensions, and any change that occurs in any of these dimensions affects the other two dimensions, whether negatively or positively.
- Multidimensional indicators: in the environmental, social and economic dimensions of sustainable development.
- Participation: ensuring everyone's participation in the decision-making process and ensuring absolute transparency.
- Precaution and reservation: wisdom in making decisions and getting rid of problems by taking reasons and anticipating measures, as well as looking for treatment after the occurrence of the problem.
- Social and regional justice: by creating opportunities for a decent life for all the inhabitants of the earth equally and ensuring this standard of life for future generations.

The environmental dimension of sustainable development

The environmental dimension is concerned with preserving biological and natural resources and ecosystems, and this requires decision-makers to achieve environmental balance by preparing policies and procedures that ensure the achievement of this balance, as the process of economic growth is usually followed by depletion of the natural environment from air pollution, climate change and loss of biodiversity. These challenges are environmental limits that must be taken into account, which regulate consumption, population growth, and misuse of the environment, such as water depletion, logging, and soil erosion **(Muhammad, 2018)**.

Achieving environmental balance aims to raise the standard of living in all aspects, and to maintain environmental peace by organizing environmental resources, which constitute the basic element in any development activity, which determines the directions of activities organized by development and the locations of its projects **(Hamed, 2019)**.

The environmental dimension includes a number of tasks that fall under it, and among these tasks **(Muhammad, 2018)**:

- Protection of soil and vegetation cover.
- Protection of natural resources and water.
- Climate protection from global warming.
- Slow down the process of extinction and the destruction of shelters of biological systems significantly.

One of the most important principles of this dimension is that it is based on flexibility, i.e. the ability of the ecosystem to maintain its ecological integrity and its ability to adapt, and in the absence of flexibility, the ecosystem becomes more vulnerable to other threats such as pollution, carbon dioxide accumulation, the elimination of the ozone layer, and natural habitats that allow ensuring biodiversity. Hence the focus of environmentalists on the concept of environmental limits that cannot be crossed by consumption and depletion **(Mohamed, 2017)**

As we mentioned above, it emerged because of ill-conceived economic growth. The solution to this problem is that the roots of the environmental problem depend on bringing about changes in the characteristics of the economic system. From this point of view there were intense efforts to find

solutions with regard to the environmental issue, including the “Cocoyoc” Declaration in Mexico in 1974, report The United Nations Commission on Environment and Development in 1987, the World Bank's emphasis on the need to follow patterns of sustainable development in 1992, the "Rio" Declaration on Development and the Environment in Brazil in 1992, and others.

Among the recommendations and proposals submitted by these efforts were aimed at finding solutions, to varying degrees, to the challenges facing sustainable development, including **(Refai, 2019):**

1. Issues of energy, fuel and toxic emissions: addressing them by directing the use of clean and renewable energy, in addition to the efficient use and protection of existing energy sources.
2. Putting environmental considerations into the calculation of the economic plan: by making the environmental assessment of the project one of the basics of accepting any project before its implementation.
3. Providing the necessary requirements for integrating the environmental dimension into the development planning process by making factories responsible for the impact of their activities on the environment from the stage of production to the stage of consumption and the waste products left after that, so that their impact is not negative on the environment and subject them to strict environmental standards.

Dependent variable: project management practices of private sector companies in the Kingdom of Saudi Arabia

The practices of private sector companies in the application of environmental development in the Kingdom

By 2020, the urgency of pursuing sustainability goals has become evident not only to environmental researchers but to the global community as a whole. This common goal obliges all stakeholders to mitigate climate change **(Al Kufy, F. 2021)** Consumers are fully aware of the harmful consequences associated with the irresponsible exploitation of natural resources, waste pollution, and greenhouse gas emissions. While people are less inclined to purchase services and products from socially irresponsible service providers, governments pressure corporate players to improve their business operations **(Doyle, E. 2020)** In response, most companies will not be able

to maintain their competitive advantage without embracing sustainability trends to counter climate change.

In the policy documents representing Vision 2030, launched in 2016, and the subsequent National Transformation Program for 2020 (**Nurunnabi, M.2017**), the intent is to develop a set of actionable goals. The overarching goal is to reduce the country's dependence on non-renewable resources, such as oil and gas, and to promote economic diversification, including the development of specific sectors (such as healthcare, education, infrastructure, and tourism). The National Transformation Program links Vision 2030 with tangible goals, key performance indicators, as well as goals and standards that must be followed by all economic and development sector institutions (that is, the entities that are expected to implement the implementation of Vision 2030). In such documents, diversification of the Saudi economy is vital to its sustainability.

Sustainable development entails three conceptual areas: (1) social and economic development compatible with environmental constraints, (2) consideration of needs, which entails redistribution of resources to protect the well-being of all, and (3) the prospect of sustainable use of resources to ensure the well-being of future generations (**Tomislav, K. 2018**) In other words, sustainable development targets three major dimensions of human existence (i.e. economic, social and environmental spheres) that are essential to the survival of the planet in the coming years (**Silvestre, B.S. 2019**).

According to the Bellagio Principles for assessing progress towards sustainable development, indicators should be used to measure sustainable development initiatives and outcomes at any given time. Although there are specific guidelines that both Vision 2030 and the 2020 National Transformation Program align in principle with, the existing literature is not entirely clear as to the extent of progress that has been made across the various sectors of the economy in Saudi Arabia and within society at large and more importantly However, it is not clear whether the COVID-19 pandemic has weakened or merely delayed the achievement of targets set worldwide. (**Sachs, J.; Kroll, C. 2021**)

There are 17 Sustainable Development Goals that can be measured by 231 unique global indicators and Saudi Arabia is part of the region called “North Africa and Western Asia”.

According to the Outline of Progress from 2022, the current levels achieved in the region for each of the 17 targets vary widely, ranging from “off target” to “target met”. In Saudi Arabia, some goals have been overshadowed by others, such as Goal 7 (i.e. ensuring access to modern, reliable, sustainable and affordable energy for all). The country has focused on developing renewable energy through programs and projects targeting solar energy, wind energy, and nuclear energy. Thus, a reasonable issue to consider is how "green" a country is. A green economy is defined as one whose outcomes include a low carbon footprint, resource efficiency, well-being, and social justice. As such, a green economy represents the economic, environmental, and social domains of sustainable development (i.e. the three main building blocks). **(D’amato, D. 2021)**

Chaaben, et al. (2022) who used the EEPSE Green Economy Index (EEPSE GEI) to determine the extent to which sustainable development was achieved during the period 2015-2020 in Saudi Arabia, found mixed results. It is worth noting that the index is based on five indicators: quality of education, economy, civil society, government, and natural environment. Overall, from the year the Vision 2030 plan was launched (2016) to 2020, the EEPSE GEI score shows significant progress (from 47.32 to 51.12). However, a closer look at the indicators also shows that Saudi Arabia faces major challenges in environmental protection and economic diversification. Specifically, challenges include high per capita energy-related carbon dioxide and other greenhouse gas emissions, continued limited adoption of renewable energy technologies by industries and consumers, weak environmental regulations, and poor awareness of consumers regarding environmental protection. **(Chaaben, N. 2022)**

One study confirmed that if the role of senior management in solving environmental problems and issues is not compatible with environmental laws and regulations, this would lead to a deterioration in the environmental performance of the facility **(Desgane-Sinclair & Gabel 1993)**. One of the leading studies in environmental management research also indicated that the implementation of innovative practices by senior management and taking proactive attitudes to protect the environment helps the organization to improve its environmental performance and competitiveness at the same time **(Linde & Porter, 1995)**. This means that the commitment of senior management to its responsibilities towards environmental protection is an important strategic indicator in measuring the extent of improving environmental performance). For

example, when the enterprise achieves better environmental performance, it achieves a competitive advantage, by further improving the quality of the product by being an environmentally friendly product and saving costs, and this in turn leads to improving the financial performance of the enterprise. **(Vredenburg & Sharma 1998; 1996, McLaughlin & Klassen)**

Just as the commitment of senior management is very important in supporting the efforts of environmental management, it is also considered a crucial and important party in the field of accounting. Environmental accounting is the system used by establishments to address environmental issues **(Appiah, et al. 2020)**. One study linked the success of environmental accounting the role of environmental senior management **(Shield, 1995)**. The reason is that senior management plays an important strategic role in improving environmental performance, not only by providing resources, but also by motivating them to accept and adhere to environmental laws and regulations **(Shin & Cai, Jun, 2006)**.

Attention to human resource management (for example) requires providing environmental training activities for employees, which is considered one of the important ways to integrate the natural environment into decision-making processes. Raw materials, rationalization of water and energy consumption, and reduction of emissions **(Wagner, 2011)**.

The results of some studies agree that setting monetary incentive schemes for employees increases the success of environmental activities and thus improves environmental performance **(Russo, M.V, & Harrison, N.S. 2005)**. Business interests, thus motivating employees to comply with environmental laws and regulations.

From the aforementioned, the researchers believe that in order to integrate sustainable environmental development into project management practices in manufacturing companies, it is necessary to:

- Urging leaders in manufacturing companies in the Kingdom of Saudi Arabia to conduct marketing research on the importance of environmentally friendly products. .

- Encouraging departments in factories to conduct research aimed at improving environmental performance within companies, and to conduct research related to environmental issues outside the company
- For manufacturing companies in the eastern region, there is a need for senior management to adhere to its responsibilities towards the environment and to apply the environmental management system in the Kingdom's factories, because this leads to improving their financial performance.
- Conducting future research on the benefits and difficulties of applying the environmental management system in companies operating in the Kingdom of Saudi Arabia and its impact on financial performance using financial statements and measuring the impact before and after applying the environmental management system.

Part Three:

The practical study and its methodological procedures

Study Approach

The study used the descriptive analytical approach to conduct this study, through interviews with managers of private companies, stakeholders and those concerned with this field, in addition to designing an electronic questionnaire that includes the variables of the study as a tool for data collection, and then examining and analyzing this data as follows.

- Descriptive approach: by collecting data from secondary sources such as books, magazines, previous studies and research in order to formulate the theoretical framework of the study and shed light on the variables of the study fully.
- The analytical approach: This is done through interviews and designing a questionnaire that includes the variables of the study as a tool for collecting data, and then examining and analyzing this data.

Study limits

- Spatial limits: This study was limited to companies operating in the private sector in most regions of the Kingdom of Saudi Arabia
- Temporal limits: This study was conducted during the second semester 2022-2023
- Human limits: All administrative workers, managers and heads of departments in private sector companies in the Kingdom of Saudi Arabia.

Study community

All administrative workers, managers and heads of departments in all companies operating in the private sector in the Kingdom of Saudi Arabia, amounting to (402) individuals.

The study sample

A simple random sample was used to select the study sample, and Table 1 shows that.

Authenticity of the content

The questionnaire is based on a previous study by (Delmas, M. A., Aigner, D. J., & Toffel, M. W. 2010). However, We have made some amendments to the questionnaire to make it more relevant to the current study.

Analyze and present the results of the study

After completing the data collection through an interview and a questionnaire prepared by the researchers for the purpose of collecting the necessary data to test the study model, which was distributed to the targeted study sample, which is 402 male and female employees and managers working in private sector companies in the Kingdom of Saudi Arabia. The data was analyzed and its results presented, in order to verify or refute the validity of the hypotheses put forward in the proposed study model.

Characteristics of the demographic sample

- Age

The table (table:1) depicts the age distribution of the respondents who participated in the survey. A total of 402 persons were surveyed. The respondents are grouped into various age groups: 18-24, 25-34, 35-44, 45-54, 55-64, and 65 and older. The age group "18-24" consists of 58 respondents, accounting for 14.4% of the entire sample. This group's proportion is 14.4% of the whole responder pool. The "25-34" age group has 121 respondents or 30.1% of the entire sample. This category gives the biggest percentage to the total distribution, with 30.1% of responses falling within this age range. In the "35-44" age category, there are 118 respondents, making up 29.4% of the entire sample. Nearly 29.4% of all responses fell within this age category. The "45-54" age group consists of 67 respondents, constituting 16.7% of the overall sample. This group represents 16.7% of the whole respondent pool. Within the "55-64" age category, there are 30 respondents, making up about 7.5% of the entire sample. This group represents 7.5% of respondents. The oldest age category, "65 and older," had 7 respondents, accounting for 1.7% of the overall sample. This group contributes 1.7% of the whole respondent pool. The age bar chart also visualizes these results.

Table 1: Age

Table:1		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	18-24	58	14.4	14.4	14.7
	25-34	121	30.1	30.1	44.8
	35-44	118	29.4	29.4	74.1
	45-54	67	16.7	16.7	90.8
	55-64	30	7.5	7.5	98.3
	65+	7	1.7	1.7	100.0
	Total	402	100.0	100.0	

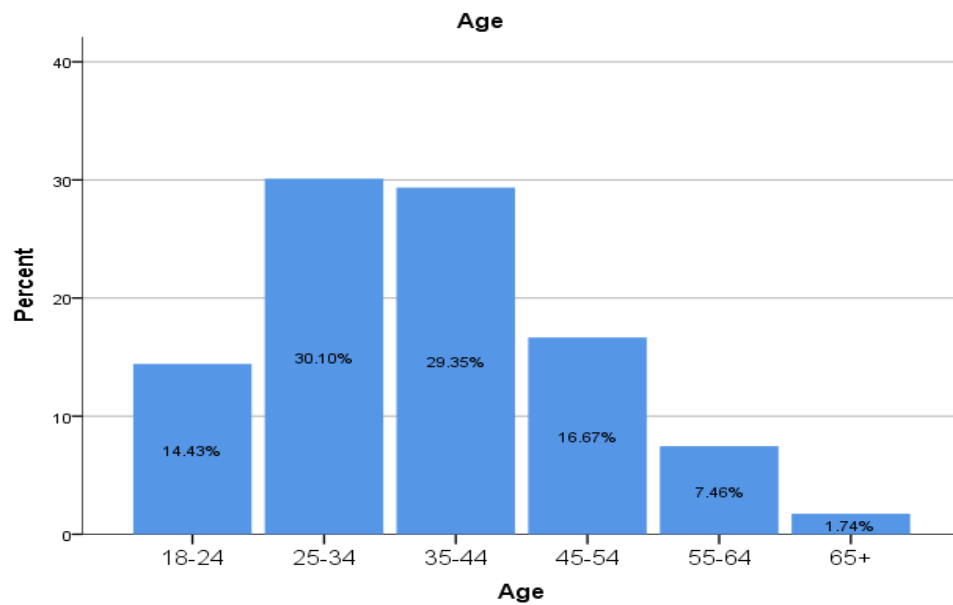


Figure 1 :Age

- Occupation

Among the numerous occupation categories, several trends emerge (table:2). The most frequent occupation type is "Professional," which constitutes 29.9% of the surveyed population, demonstrating a high presence of individuals engaged in professional occupations. The "Other manager" group follows, representing 16.9% of the responses and reflecting a considerable proportion of participants having managerial responsibilities beyond the designated categories. Additionally, the "Technician" group accounts for 14.4% of the sample, demonstrating the prominence of technical occupations.

Occupational diversity is visible as well, with several additional occupation groupings comprising a range of percentages. "Project manager" (15.4%), "Student" (6.2%), and "Clerical" (6.5%) jobs are remarkable in their own right, collectively contributing to a diversified response pool. On the other hand, the "Laborer," "Other," and "Student" groups each constitute a smaller fraction of the entire sample, indicating less representation in the poll. The occupation bar chart also visualizes these results.

Table:2 Occupation					
Table:2		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	Clerical	26	6.5	6.5	6.7
	Laborer	20	5.0	5.0	11.7
	Other	22	5.5	5.5	17.2
	Other manager	68	16.9	16.9	34.1

	Professional	120	29.9	29.9	63.9
	Project manager	62	15.4	15.4	79.4
	Student	25	6.2	6.2	85.6
	Technician	58	14.4	14.4	100.0
	Total	402	100.0	100.0	

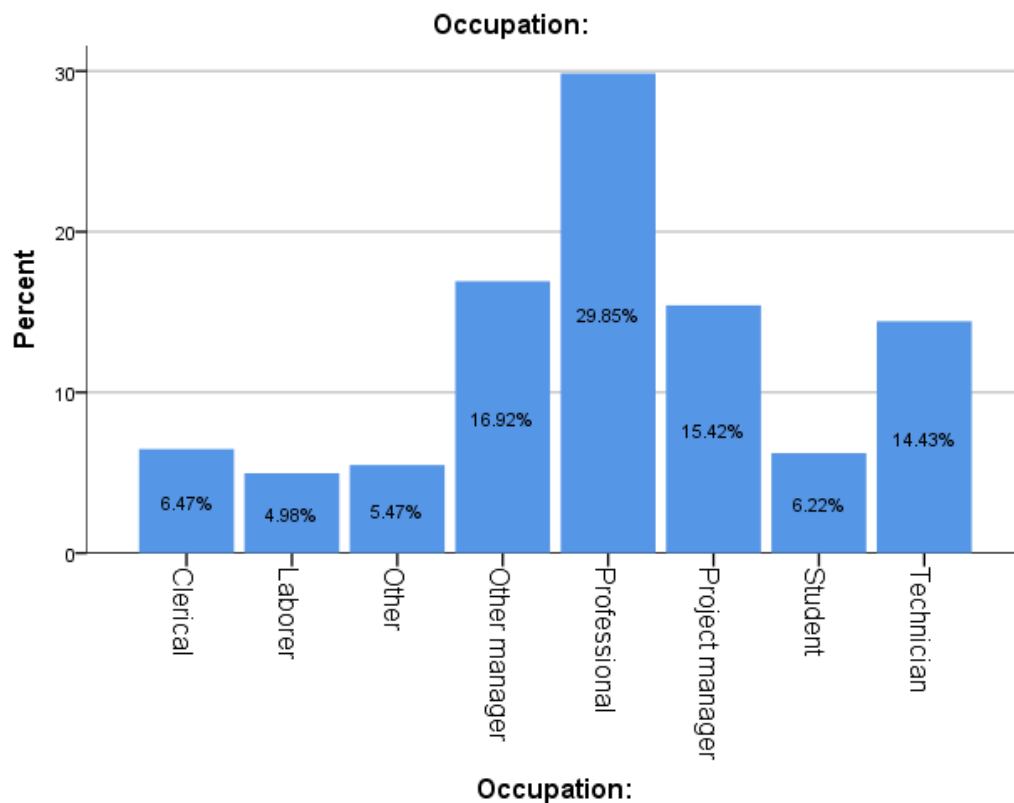


Figure 2: Occupation

- Industry

Several important observations emerge from the distribution (table:3). "Manufacturing" takes precedence, accounting for the highest frequency at 88 responses, or 21.9% of the overall sample. This implies a substantial representation of individuals working in manufacturing sectors.

The "Construction" group follows closely, with 65 responses, making up 16.2% of the total. This stresses a considerable presence within the building industry. Similarly, "Information technology" has 57 respondents, adding 14.2% to the distribution, demonstrating a substantial representation in the IT sector. "Healthcare" and "Financial services" businesses are similarly well-represented, totaling 13.4% and 11.2% of the sample, respectively. The "Retail" and "Transportation" sectors have frequencies of 32 (8.0%) and 24 (6.0%) respondents, respectively. Additionally, the "Other" industry category constitutes 9.0% of the sample, spanning a range of different sectors beyond the defined categories. The industry bar chart also visualizes these results.

Table:3 Industry					
Table:3		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	Construction	65	16.2	16.2	16.4
	Financial services	45	11.2	11.2	27.6
	Healthcare	54	13.4	13.4	41.0
	Information technology	57	14.2	14.2	55.2
	Manufacturing	88	21.9	21.9	77.1
	Other	36	9.0	9.0	86.1
	Retail	32	8.0	8.0	94.0
	Transportation	24	6.0	6.0	100.0

	Total	402	100.0	100.0	
--	-------	-----	-------	-------	--

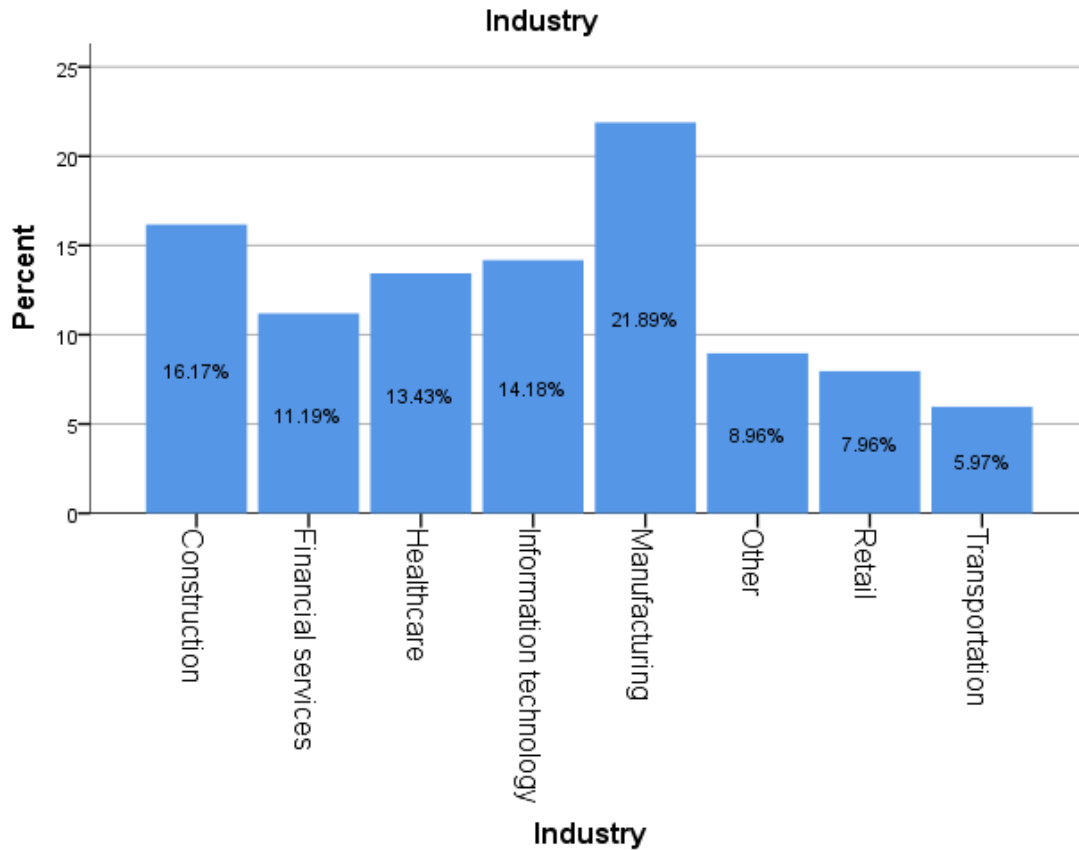


Figure 3: Industry

- Location

Noteworthy observations can be derived from the distribution (table:4). "Dammam" emerges as the most prevalent location, accounting for the maximum frequency of 117 responses, or 29.1% of the overall sample. "Jeddah" closely follows with 107 responders, contributing 26.6% to the distribution. "Other city in Saudi Arabia" constitutes 24.4% of the sample, totaling 98 respondents. This category represents a varied variety of locations inside the country outside the stated cities. "Other country" has a smaller presence with 11 responses (2.7%), showing responders from foreign

places. The "Riyadh" group covers 16.9% of the sample, with 68 responses, demonstrating a substantial presence in the capital city. The location pie chart also visualizes these results.

Table:4 Location					
Table:4		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	Dammam	117	29.1	29.1	29.4
	Jeddah	107	26.6	26.6	56.0
	Other city in Saudi Arabia	98	24.4	24.4	80.3
	Other country	11	2.7	2.7	83.1
	Riyadh	68	16.9	16.9	100.0
	Total	402	100.0	100.0	

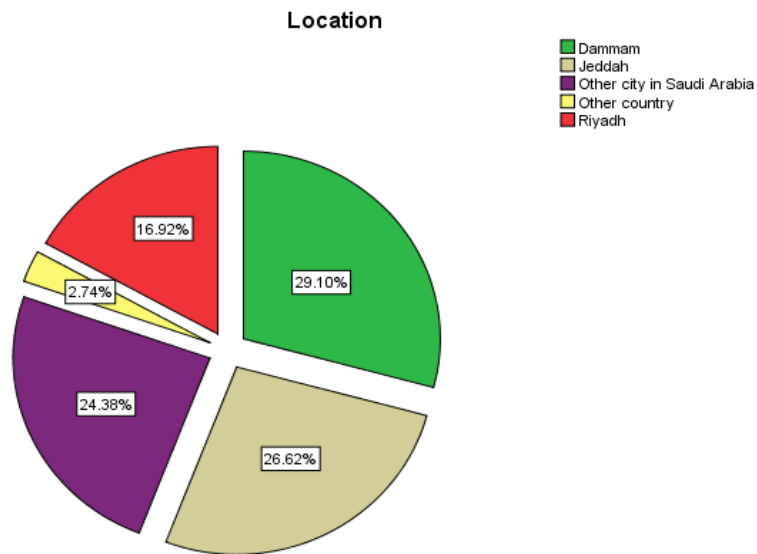
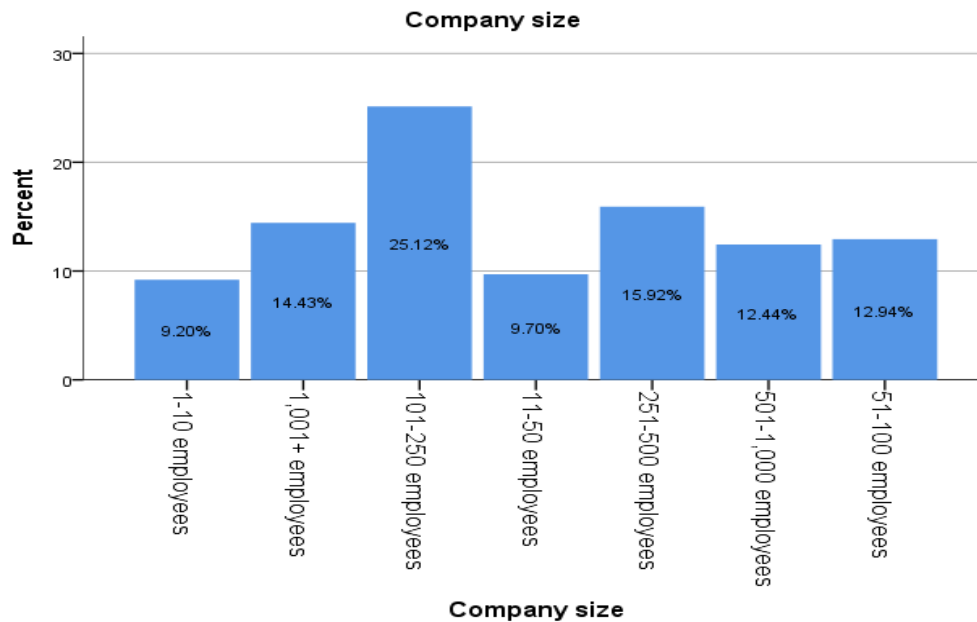


Figure 4: Location

- Company Size

Several crucial observations can be derived from the distribution (table:5). Companies with "101-250 employees" represent the largest section, with 101 respondents, accounting for 25.1% of the



entire sample. Following closely, organizations with "251-500 employees" comprise 15.9% of the sample, encompassing 64 respondents. "1,001+ employees" constitute 14.4% of the sample, with 58 responders, indicating a considerable representation of larger firms. Companies with "501-1,000 employees" form 12.4% of the sample, encompassing 50 respondents. "51-100 employees" and "11-50 employees" groups contribute 12.9% and 9.7% to the distribution, with 52 and 39 respondents respectively. Smaller enterprises with "1-10 employees" account for 9.2% of the sample, representing 37 respondents. The Company size bar chart also visualizes these results.

Figure 5: Company Size

table:5 Company size					
table:5		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	1-10 employees	37	9.2	9.2	9.5
	1,001+ employees	58	14.4	14.4	23.9
	101-250 employees	101	25.1	25.1	49.0
	11-50 employees	39	9.7	9.7	58.7
	251-500 employees	64	15.9	15.9	74.6
	501-1,000 employees	50	12.4	12.4	87.1
	51-100 employees	52	12.9	12.9	100.0
	Total	402	100.0	100.0	

- **Environmental awareness**

Several important findings come from the distribution (table:6). A large section of respondents falls inside the "Somewhat aware" category, constituting 38.1% of the overall sample, or 153 persons. This group shows a sizable population with a moderate level of environmental awareness, finding a balance between different degrees of consciousness. Meanwhile, the "Not very aware" category occupies a substantial share, with 31.3% representation, or 126 respondents. This group symbolizes a considerable fraction of individuals who recognise their need for better awareness and comprehension of environmental concerns. On the opposite end of the spectrum, "Very aware" respondents, totaling 20.9% of the total, or 84 individuals, demonstrate an exceptional level of environmental mindfulness and understanding.

Conversely, the category "Not aware at all" maintains the smallest representation, with 38 responses, or 9.5% of the sample, showing persons who are least engaged with environmental issues. The environmental pie chart also visualizes these results.

Table:6 Environmental awareness					
Table:6		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	Not aware at all	38	9.5	9.5	9.7
	Not very aware	126	31.3	31.3	41.0
	Somewhat aware	153	38.1	38.1	79.1
	Very aware	84	20.9	20.9	100.0
	Total	402	100.0	100.0	

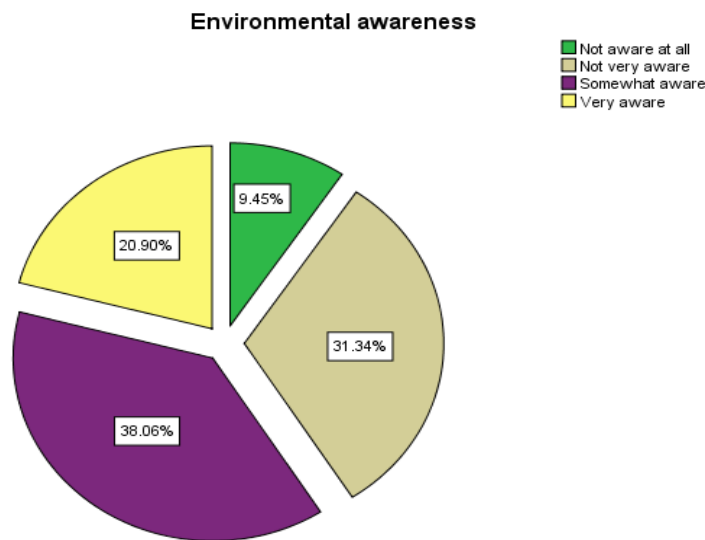


Figure 6: Environmental awareness

- Environmental concerns

The distribution offers numerous crucial insights (table:7). "Air pollution" emerges as a key environmental worry, with 79 respondents expressing apprehension, constituting 19.7% of the overall sample. This conclusion highlights the significance of air quality as a serious issue within the examined population. "Climate change" follows closely, eliciting worry from 75 responders, or 18.7%. This category demonstrates a strong knowledge of the issues faced by climate change and its repercussions. "Deforestation" constitutes another major concern, with 45 respondents (11.2%) expressing apprehension about the repercussions of habitat loss. The "Extinction of species" category displays concern from 35 respondents, or 8.7%, demonstrating a considerable recognition of the significance of biodiversity protection. Concerns related to "Land pollution" receive the attention of 85 respondents (21.1%), demonstrating the recognition of the impact of human activities on soil quality.

Additionally, "Water pollution" captures the worry of 64 respondents, or 15.9%, underscoring the necessity of keeping clean and accessible water resources. The "Other" group holds 4.5%

representation, with 18 responses, reflecting a varied range of specific environmental concerns. The environmental concern pie chart also visualizes these results.

Table:7 Environmental concerns					
Table:7		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.2	.2	.2
	Air pollution	79	19.7	19.7	19.9
	Climate change	75	18.7	18.7	38.6
	Deforestation	45	11.2	11.2	49.8
	Extinction of species	35	8.7	8.7	58.5
	Land pollution	85	21.1	21.1	79.6

	Other	18	4.5	4.5	84.1
	Water pollution	64	15.9	15.9	100.0
	Total	402	100.0	100.0	

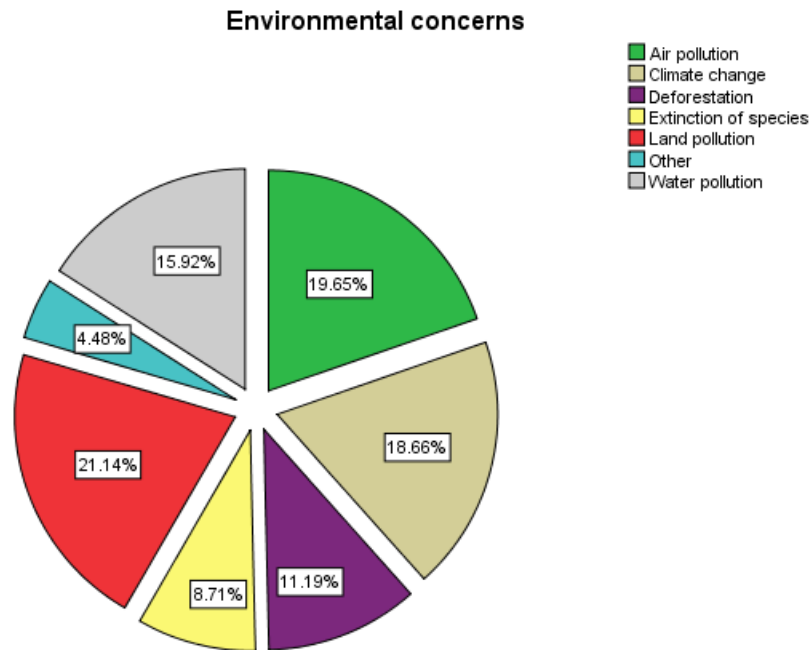


Figure 7: Environmental concerns

Check the study hypotheses

Hypothesis 1: It is hypothesized that the education level of employees shapes the awareness toward environment.

To test the hypothesis that the education level of employees effects their awareness of the environment, an Analysis of Variance (ANOVA) was done using the data (table:8). The ANOVA examines whether there are statistically significant differences in environmental awareness scores across different education levels. The "Between Groups" analysis produced a non-significant F-statistic of 0.863 with a p-value of 0.460. Since the p-value is larger than the significance level

($\alpha=0.05$), there is insufficient evidence to reject the null hypothesis. Therefore, based on this data, we do not find strong evidence for the notion that education level impacts awareness of the environment among employees.

ANOVA					
Table:8 Education level					
Table:8	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.833	3	1.944	.863	.460
Within Groups	894.117	397	2.252		
Total	899.950	400			

Across tabulation also formed to support the hypothesis test (table:11). The cross-tabulation table demonstrates the association between respondents' "Education level" and their "Environmental awareness." Each cell in the table displays the count and percentage of respondents falling into a given combination of education level and environmental awareness category.

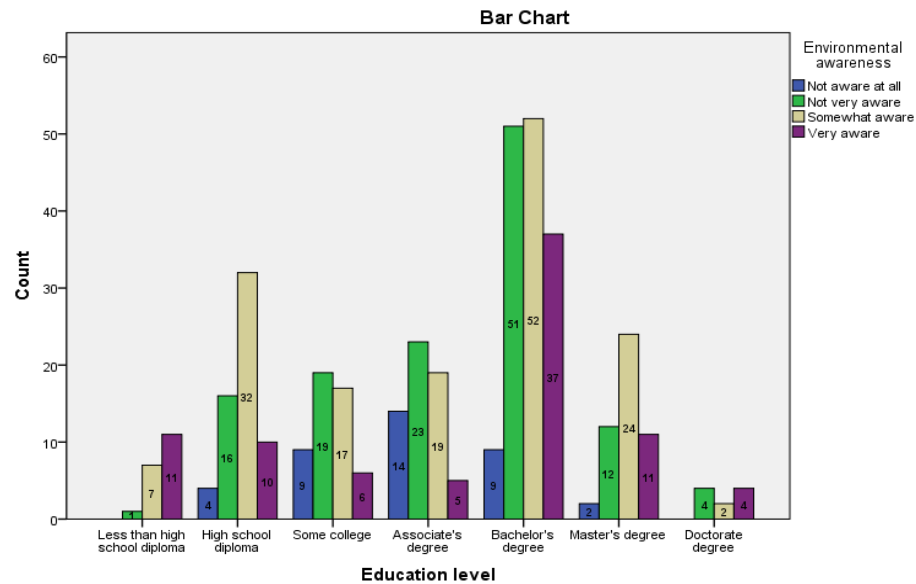
Among those with a "Less than high school diploma," 4.7% were "Somewhat aware" of the environment, while 2.7% were "Very aware." No responders in this category reported being "Not aware at all." For responders with a "High school diploma," 8.0% were "Somewhat aware," while 2.5% were "Very aware." A tiny fraction (1.0%) reported being "Not aware at all."

Those with "Some college" education had 4.2% with "Somewhat aware" awareness and 1.5% with "Very aware" awareness. Respondents with a "Associate's degree" indicated comparable proportions as the "Some college" category, with 4.7% and 1.2% being "Somewhat aware" and "Very aware," respectively. For persons with a "Bachelor's degree," the awareness levels were more varied: 13.0%

were "Somewhat aware," and 9.2% were "Very aware. "Those with a "Master's degree" had 6.0% "Somewhat aware" and 2.7% "Very aware. "Respondents with a "Doctorate degree" had a fair distribution across awareness levels. Across all education levels, the majority of respondents (38.2%) fell into the "Somewhat aware" category of environmental awareness. The educational level bar chart also visualizes these results.

Table:11 Education level * Environmental awareness Crosstabulation							
Table:11			Environmental awareness				Total
			Not aware at all	Not very aware	Somewhat aware	Very aware	
Education level	Less than high school diploma	Count	0	1	7	11	19
		% of Total	0.0%	0.2%	1.7%	2.7%	4.7%
	High school diploma	Count	4	16	32	10	62
		% of Total	1.0%	4.0%	8.0%	2.5%	15.5%
	Some college	Count	9	19	17	6	51
		% of Total	2.2%	4.7%	4.2%	1.5%	12.7%
	Associate's degree	Count	14	23	19	5	61
		% of Total	3.5%	5.7%	4.7%	1.2%	15.2%
	Bachelor's degree	Count	9	51	52	37	149
		% of Total	2.2%	12.7%	12.7%	9.2%	38.2%

		% of Total	2.2%	12.7%	13.0%	9.2%	37.2%
	Master's degree	Count	2	12	24	11	49
		% of Total	0.5%	3.0%	6.0%	2.7%	12.2%
	Doctorate degree	Count	0	4	2	4	10
		% of Total	0.0%	1.0%	0.5%	1.0%	2.5%
Total		Count	38	126	153	84	401
		% of Total	9.5%	31.4%	38.2%	20.9%	100.0%



Hypothesis 2: It is hypothesized that the number of complains from different stockholders decrease with the increase of environmental sustainability audit.

To test the hypothesis that the number of complaints from different stakeholders reduces with an increase in environmental sustainability audits, an Analysis of Variance (ANOVA) was done using the data (table:9). The ANOVA analyzes if there are significant variations in the amount of complaints across increasing degrees of environmental sustainability audits.

The "Between Groups" analysis indicates a significant F-statistic of 4.669, with an extremely low p-value of 0.000. Since the p-value is below the significance level ($\alpha = 0.05$), there is strong evidence to reject the null hypothesis. This implies that there is a statistically significant association between the number of environmental sustainability audits and the number of complaints from different stakeholders. The results confirm the hypothesis that an increase in environmental sustainability audits is connected with a drop in the number of complaints from stakeholders.

ANOVA					
Table:9 Number of Audit					
Table:9	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8216.604	37	222.070	4.669	.000
Within Groups	15171.216	319	47.559		
Total	23387.821	356			

Hypothesis 3: It is hypothesized that the environmental sustainability objectives and goals change depending on the type of industries.

To test the hypothesis that environmental sustainability aims and goals differ dependent on the kind of industries, an Analysis of Variance (ANOVA) was done using the data (table:10). The ANOVA

evaluates if there are statistically significant differences in sustainability targets across various industry categories.

The "Between Groups" analysis suggests a statistically significant F-statistic of 2.409, followed with a p-value of 0.027. Since the p-value is below the significance level ($\alpha = 0.05$), there is evidence to reject the null hypothesis. This shows that there are considerable variances in environmental sustainability aims and goals across various types of enterprises. The results give support for the hypothesis that industry type effects the setting of environmental sustainability objectives and goals.

NOVA					
Table:10 Objectives toward Sustainability					
Table:10	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	155.242	6	25.874	2.409	.027
Within Groups	4220.508	393	10.739		
Total	4375.750	399			

Conclusion

Growing regulatory pressure and consumer environmental awareness have transformed sustainable environmental development from a strategic option into a necessity for both private companies and governments. However, despite huge commitments to achieving carbon neutrality in the long term, by 2050, ideally, countries are still far from achieving industrial sustainability targets. To achieve tangible progress, governments are collaborating with the private sector to accelerate the implementation of environmental sustainability plans. The Government of Saudi Arabia is launching national green incentives and environmentally friendly licensing requirements, while maximizing regional cooperation and synergy in the field of sustainability. Moreover, companies in the private sector are actively integrating sustainability components into their corporate and business strategies, ensuring the adoption of effective sustainability measures across their industrial value chain. This will create a long-term impact and chart the course for a sustainable future.

Our study is one of the few to be conducted in Saudi Arabia, in the heart of the oil and gas-producing region. As such, the current study provides a window into the minds of university students, managers and employees not only in private sector companies but also even in the public sector in the Kingdom of Saudi Arabia. Thus, the views of these participants can contribute to the theory and practice of sustainable environmental development in a social and economic context that can be described as presenting a serious challenge to desired change.

It can be said that human behavior is a dynamic balance of forces, often working in two opposing directions: those that facilitate change and those that constrain it. The first step in fostering change is to unfreeze the status quo. The second step is to set a goal, to serve as a new state of equilibrium to be achieved. The third step is to freeze the achieved target to ensure stability. At every step, the role of the community (private sector companies and their employees and the government) in which a person lives is crucial. Groups can exert significant social influence through information sharing, observational learning, and more direct interventions. As such, reference groups should be considered as important factors in determining the extent to which participants embrace the changes required for sustainable development in Saudi Arabia.

Although our study did not address these factors, its methodology and findings can provide useful information for cross-cultural studies, as well as help develop interventions that support the widespread implementation of sustainable ecosystems worldwide. In an interdependent world, the concept of intercultural awareness reflects a person's recognition of cultural diversity. It is an indicator of an individual's knowledge of the unique characteristics of different cultures and their impact on interpersonal exchanges and relationships. Thus, understanding the opinions and reactions towards the concept of sustainable environmental development for private sector companies and those working in them is just a first step towards the successful implementation of sustainable development around the world.

Recommendations

The study recommends the following:

- The need to push companies operating in the private sector in the Kingdom of Saudi Arabia to improve environmental disclosure by presenting environmental aspects in environmental reports submitted to relevant parties.
- Increasing government interest in the aspects of sustainable environmental development by stimulating business establishments concerned with the environment with the help of environmental experts to give confidence and credibility to their work.
- Encouraging establishments to find specialized environmental departments in their organizational structure whose primary mission is how to preserve and monitor aspects of sustainable environmental development and avoid potential environmental hazards.
- The need for private sector companies to develop their staff in how to take care of aspects of sustainable environmental development.
- The competent state agencies must conduct a study to assess the environmental impact of industrial projects before issuing approvals for the establishment of these projects, and these projects must be visited periodically to verify the environmental damage resulting from them.
- The Projects Development Agency shall provide environmental support to all projects operating in the private sector that borrow from it, provided that this support is carried out periodically and continuously and the foundations of environmental awareness and sustainable development are established through bulletins, instructions and imposition of penalties, and the need for continuous environmental review to assess and improve the environmental impact.
- Develop indicators to measure the efficiency of applying environmental management mechanisms for governmental and non-governmental bodies.
- The importance of supporting and encouraging investment in clean technology, and providing material and moral incentives to support private sector projects to shift from traditional work to environmentally friendly work and green development.
- Spreading environmental awareness and developing the spirit of environmental responsibility for citizens by developing a scientific course on environmental management and sustainable development to be taught in universities and higher institutes.

Part Four:

Study Appendices

References

1. Ashraf Muhammad Abu Saree Muhammad, (2013). The impact of developing slums on achieving sustainable development: an applied study, an unpublished master's thesis, Sadat Academy for Administrative Sciences.
2. Ahed Ibrahim Al-Quraan, and Yousri Amin Sami. (2016) Environmental auditing and its role in achieving sustainable development in the business sector. The Fifteenth Annual International Scientific Conference on Business: Sustainability and Competitiveness in Business, Faculty of Economics and Administrative Sciences, Al-Zaytoonah University of Jordan, Amman, Jordan.
3. Abdel Moneim Ahmed El-Feky, Mohamed Abdel-Baqi Mohamed Ibrahim, (2018). Environmental Management for Urbanism, International Journal of Arts, Humanities and Social Sciences, Issue 13 - Part 1.
4. A.J. Gilbert Silvius, Ron Schipper (2015) A Conceptual Model for Exploring the Relationship Between Sustainability and Project Success. *Procedia Computer Science*, 64, 334- 342.
5. Al-Tamimi, Faisal Muhammad Aliwi, (2020). Environment and sustainable development in Iraq: Controversial exploitation of natural resources and criminal protection of the environment. *Al-Hikma Journal for Economic Studies*, (13). 79-99, Treasures of Wisdom Foundation for Publishing and Distribution.
6. Al Kufy, F. Middle East's circular economy expectations for the next ten years. *Open Sci. J.* 2021, 6, 1–10.
7. Appiah, B. K., Donghui, Z., & Majumder, S. C.(2020). "Effects of Environmental Strategy, Uncertainty and Top Management Commitment on the Environmental Performance: Role of Environmental Management Accounting and Environmental Management Control System". *International Journal of Energy Economics and Policy*, (vol. 10, iss.1), pp. 360–370.
8. Chaaben, N.; Elleuch, Z.; Hamdi, B.; Kahouli, B. Green economy performance and sustainable development achievement: Empirical evidence from Saudi Arabia. *Environ. Dev. Sustain.* 2022.
9. Coglianese, C. & Nash, N. (2001). Environmental management system and the new policy agenda. In, Coglianese, C. and Nash, J. (Eds) *Regulating From the Inside: Can Environmental Management Systems Achieve Policy Goals?*, RFF Press, Washington, DC. Resources for the Future Press, pp.1-25
10. Doru, N. F. (2015). Concepts of Sustainable Development. Theoretical and Methodological Approaches. *Impactul Transformarilor SocioEconomice si Tehnologice la Nivel National*, 2(2), pp. 73-82. Available at SSRN: <http://ssrn.com/abstract=2632070>.
11. Ding et al. Towards sustainable production and consumption: assessing the impact of energy productivity and eco-innovation on consumption-based carbon dioxide emissions (CO₂) in G-7 nations. *Sustain. Prod. Consum.* (2021)
12. Damas, Amna Hassan (2020). Education for sustainable development: a proposed model for chemistry education in the future. *International Journal of Educational and Psychological Sciences*, (55). 63-100, Arab Foundation for Scientific Research and Human Development.
13. Doyle, E.; Perez-Alaniz, M. On the Pillars of Sustainable Development: A Sustainable Competitiveness Approach. 2020. Available online: <https://www.semanticscholar.org/paper/On-the-Pillars-of-Sustainable-Development-%3A-A-Doyle-Perez-Alaniz/0ac19425cf993778a37d3514b3e30675af742aac> .
14. D'amato, D.; Korhonen, J. Integrating the green economy, circular economy and bioeconomy in a strategic sustainability framework. *Ecol. Econ.* 2021, 188, 107143.
15. Ezzi, Siham, Boushaer, Hajar (2019). Sustainable development: the legal and institutional framework for environmental protection in Algeria. *Horizons of Science Journal*, (15), 224-234, Zayan Ashour University, Djelfa.
16. Gabel, H. L. & Sinclair-Desgagné, B. (1993). "Managerial incentives and environmental compliance". *Journal of Environmental Economics and Management*, (vol. 24, iss.3), pp.229- 240.
17. Gunal, M. M. (2019). *Simulation for Industry 4.0: Past, Present, and Future*: Springer.
18. Hamed, Nouredine (2019). The environmental dimension of sustainable development. *Journal of Economic, Administrative and Legal Sciences*, 4 (12), 146-158, National Research Center, Gaza.

19. Jun, M., Cai, S., & Shin, H. (2006). "TQM practice in maquiladora: Antecedents of employee satisfaction and loyalty". *Journal of Operations Management*, (vol. 24, iss.6), pp.791–812.
20. Khababa, Suhaib (2019). *The Role of Industrial Zones in Achieving Sustainable Development in the Euro-Maghreb Region: A Comparative Study Between France and Algeria*, Master Thesis, Ferhat Abbas Setif University, Algeria.
21. Klassen, R. D., & McLaughlin, C. P. (1996). "The Impact of Environmental Management on Firm Performance". *Management Science*, (vol. 42, iss.8), 1199–1214.
22. Mahmood, H., Alkhateeb, T. T. Y., and Furqan, M. (2020). Oil sector and CO2 emissions in Saudi Arabia: Asymmetry analysis. *Palgrave Commun.* 6 (1), 88. doi:10.1057/s41599-020-0470-z
23. Mostadam Green Building Rating System (2020). Alpin limited. Available at <https://www.alpinme.com/mostadam/>.
24. Mohamed Mahmoud Ahmed Saber. (2010). The possibility of using environmental audit reports as a tool to provide the necessary information for sustainable development purposes. A proposed accounting model for environmental audit reports. *Journal of Commerce and Finance*, Faculty of Commerce, Tanta University (Issue 2). Page 361.
25. Muhammad Zaheer Hashim, Liu Chao, Chao Wang (2021) The role of project managers' attributes in project sustainability management and project performance under China-Pakistan economic corridor.
26. Muhammad Irfan, Mazlan Hassan(2019) The Effect of Project Governance and Sustainability on Project Success of the Public Sector Organizations in Pakistan. *SOCIAL SCIENCES & HUMANITIES*. 27, 177-198 .
27. M. Nair et al. Is higher economic growth possible through better institutional quality and a lower carbon footprint? Evidence from developing countries *Renew. Energy* (2021) .
28. M.A. Alsaedi et al. Investigating the relevance of environmental Kuznets curve hypothesis in Saudi Arabia: towards energy efficiency and minimal carbon dioxide emission *Clean Technol. Environ. Policy*. (2022)
29. Magda El-Sayed Mohamed Bakry, (2007). The role of international non-governmental organizations in achieving sustainable development by focusing on the environmental dimension: an applied study, Sadat Academy for Administrative Sciences
30. Muhammad, Mahasin Al-Sadiq, (2017). Sustainable development: its dimensions, components and patterns. *Money and Economics Journal*, (81), .51-50
31. Muhammad, Jaber Al-Ansari, (2018). Population density and the environmental dimension of sustainable development in Egypt. *Journal of the College of Education*, 376-396, 33, Menoufia University - College of Education.
32. Nurunnabi, M. Transformation from an oil-based economy to a knowledge-based economy in Saudi Arabia: The direction of Saudi vision 2030. *J. Knowl. Econ.* 2017, 8, 536–564
33. Porter, M. E. (1991). "Towards a dynamic theory of strategy". *Strategic Management Journal*, (vol. 12), pp.95–117.
34. Q. Jiang et al. An assessment of the impact of natural resources, energy, institutional quality, and financial development on CO2 emissions: evidence from the B&R nations *Resour. Pol.* (2022)
35. Rifai, Safaa Ali (2019). Environmental challenges and future prospects for sustainable development in Egypt. *Middle East Research Journal*, (48), 302-362, Ain Shams University - Middle East Research Center.
36. Rahim, Hind Sobeih, Jabbar, Nisreen Sattar (2020). Knowledge economy and its role in achieving sustainable development. *Arab Journal of Educational and Psychological Sciences*, (15), 420-397, Arab Foundation for Education, Science and Arts.
37. Russo, M. V, & Harison, N. S. (2005). "Organizational Design and Environmental Performance: Clues from the Electronics Industry". *Academy of Management Journal*, (vol. 48, iss.4), pp.582– 593
38. Silvestre, B.S.; Țîrcă, D.M. Innovations for sustainable development: Moving toward a sustainable future. *J. Clean. Prod.* 2019, 208, 325–332.
39. Shanavi, Nawal, Khoni, Rabeh (2020). Sustainable development: its philosophy and measurement tools. *Al-Manhal Economic Journal*, 3 (1), 78-67, Martyr Hama Lakhdar Al-Wadi University - Faculty of Economic, Commercial and Management Sciences.
40. T.S. Adebayo et al. Determinants of consumption-based carbon emissions in Chile: an application of non linear ARDL *Environ. Sci. Pollut. Control Ser.* (2021)

41. Tomislav, K. The concept of sustainable development: From its beginning to the contemporary issues. *Zagreb Int. Rev. Econ. Bus.* 2018, 21, 67–94.
42. Wanjiru Gachie(2019) Project sustainability management: risks, problems and perspective. *Problems and Perspectives in Management*, 17(1), 313-325.
43. Wagner, M. (2011). "Environmental Management Activities and Sustainable HRM in German Manufacturing Firms—Incidence, Determinants, and Outcomes". *Journal of Research in Human Resource Management*, (vol. 25, iss.2), pp.157–177
44. Y. Fernando et al. Understanding the effects of energy management practices on renewable energy supply chains: implications for energy policy in emerging economies *Energy Pol.* (2018)

Appendices

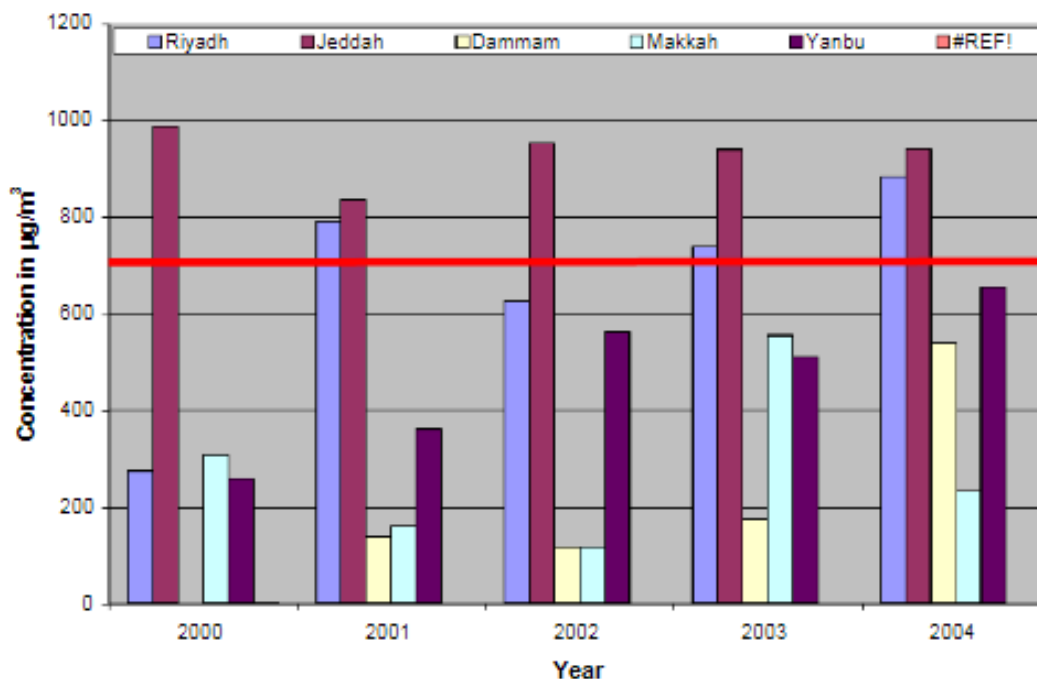


Figure1: Ambient sulfur dioxide concentration trend in major Saudi Arabian cities

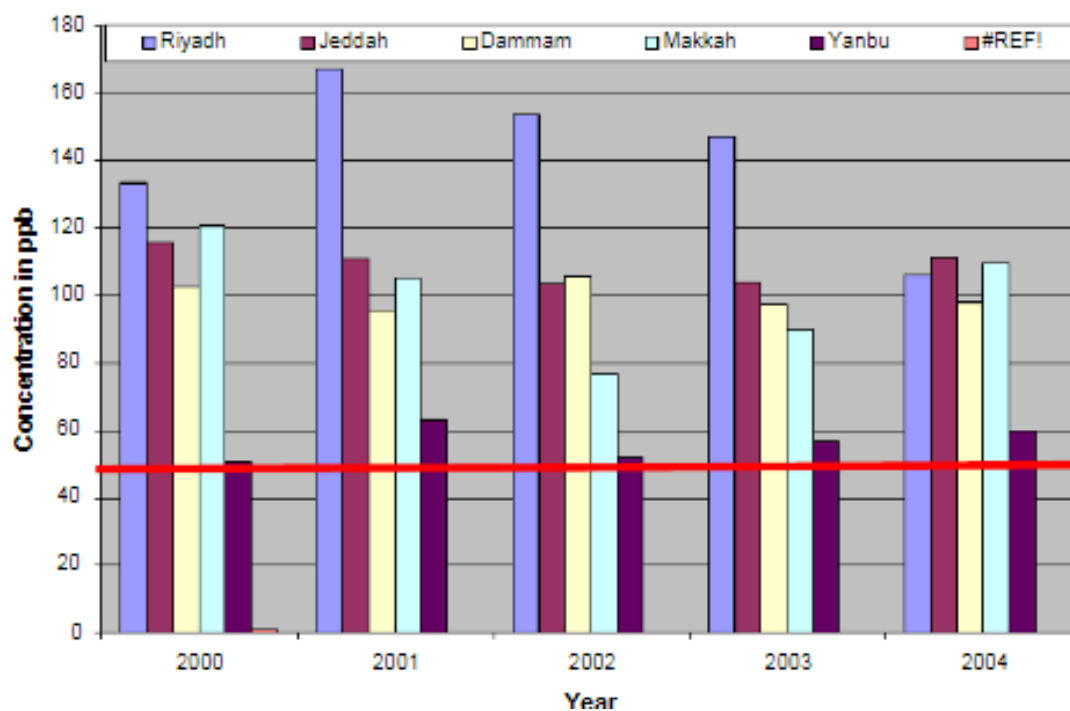


Figure 2. Ambient oxides of nitrogen concentration trend in major Saudi Arabian cities

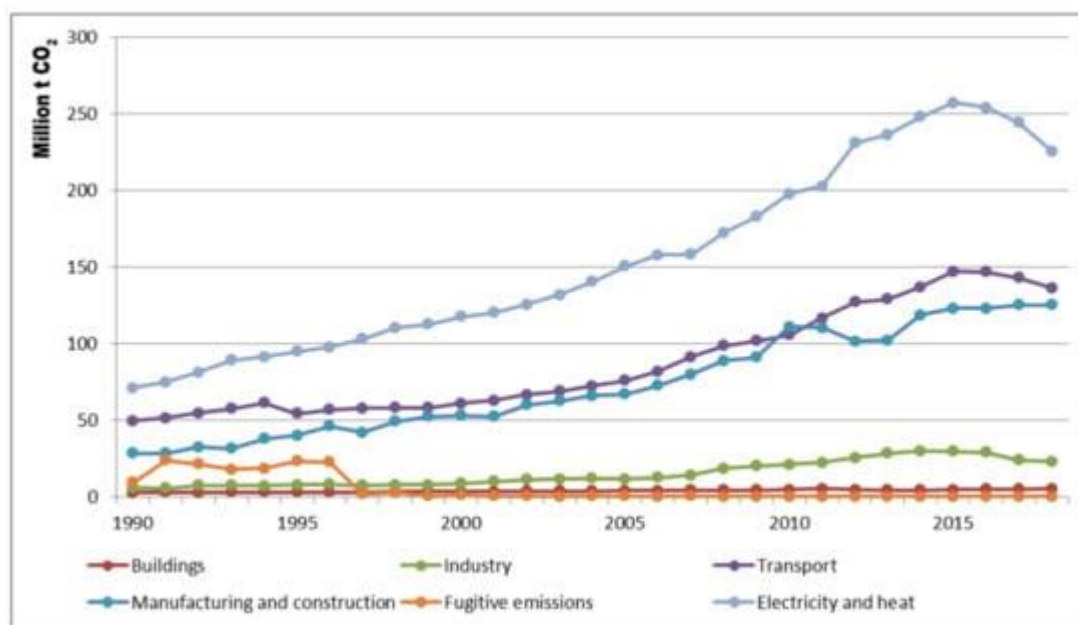


Figure 3. Saudi Arabia's historical timeline of CO₂ emissions by sector.

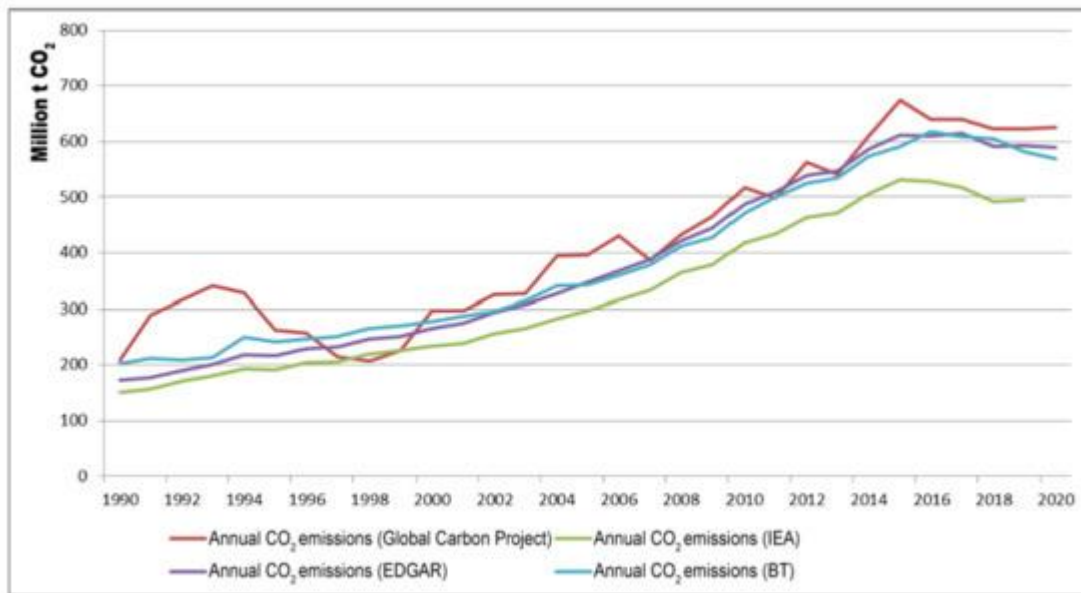


Figure 4. Saudi Arabia's annual CO₂ emissions trends from 1990 to 2020.

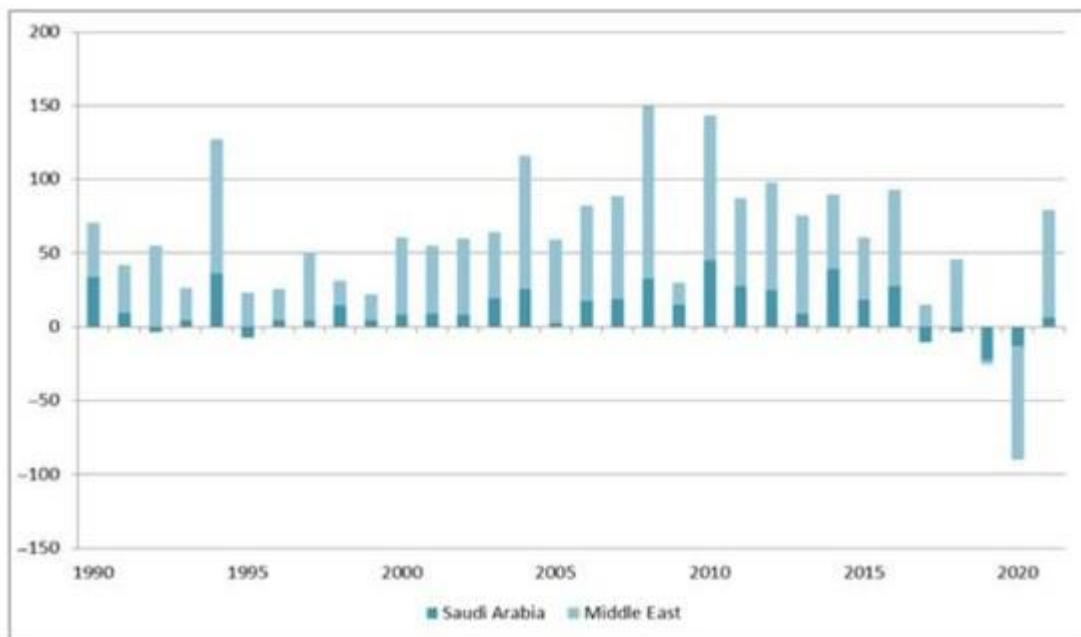


Figure 5. Year-on-year deltas of total CO₂ emissions (in a million tons) for the Middle East (including Saudi Arabia).

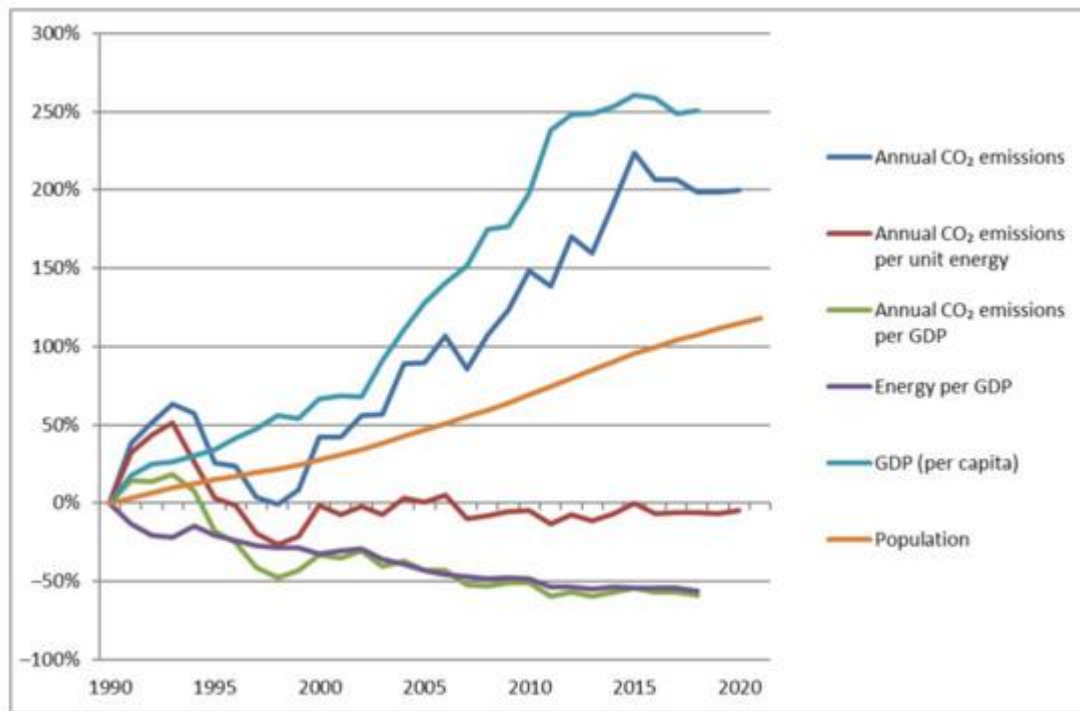


Figure 6. Year-on-year percentage change for Saudi Arabia's CO₂ emissions drivers comprising the Kaya Identity.

Questionnaire

We are a Master's candidates (Projects Management) at Midocean University of Currently, To examine this sample in order to conduct a study titled (The Impact of integrating sustainable environmental development into project management practices of private sector companies in the Kingdom of Saudi Arabia on environmental impact)

I would like to request your cooperation to answer this questionnaire. Your cooperation is highly appreciated.

The questionnaire is based on a previous study by Delmas, M. A., Aigner, D. J., & Toffel, M. W. (2010).

However, I have made some amendments to the questionnaire to make it more relevant to the current study.

The questionnaire will take approximately 15 minutes to complete. Your responses will be kept confidential and will only be used for the purposes of this study.

Thank you in advance for agreeing to participate in this study. If you have any questions.

Please do not hesitate to contact with the questionnaire preparers,

Asmaa Abdulaal (abdulaalasmaa@gmail.com)

Jassim Alnami (jiss.n.jn@gmail.com)

Jasim Al-eskait (E.jasim91@gmail.com)

The supervision of associate Professor Dr .Walid Soliman

Section A. General information

1- Gender:

Male	
Female	

2- Age:

18-24	
25-34	
35-44	
45-54	

55-64	
65+	

3- Education level:

Less than high school diploma	
High school diploma	
Some college	
Associate's degree	
Bachelor's degree	
Master's degree	
Doctorate degree	

4- Occupation:

Project manager	
Other manager	

Professional	
Technician	
Clerical	
Laborer	
Student	
Other	

5- Company size:

1-10 employees	
11-50 employees	
51-100 employees	
101-250 employees	
251-500 employees	
501-1,000 employees	
1,001+ employees	

6- Industry:

Construction	
Manufacturing	
Healthcare	
Information technology	
Financial services	
Retail	
Transportation	
Other	

7- Location:

Riyadh	
Jeddah	
Dammam	
Other city in Saudi Arabia	
Other country	

8- Environmental awareness:

Very aware	
Somewhat aware	
Not very aware	
Not aware at all	

9- Environmental concerns:

Air pollution	
Water pollution	
Land pollution	
Climate change	
Deforestation	
Extinction of species	
Other	

Section B. Environmental sustainability practices

(BESPX)

10-If your facility or company has environmental sustainability, how is it communicated?

Please check all that apply

- ☐ We do not have environmental sustainability.....

We have environmental sustainability and:

- ☐ post the environmental sustainability around our facility.....
- ☐ post it on the internet.....
- ☐ distribute it to all facility employees.....
- ☐ Most employees have discussed the environmental sustainability with a manager/supervisor.....

(BESPxi)

11-Over the past 3 years, how many times has your facility had an internal environmental sustainability audit conducted by your facility staff and/or corporate staff? _____ (If none, please enter zero)

(BESP xii)

12-Over the past 3 years, how many times has your facility had an external environmental sustainability audit conducted by third parties such as consultants, not including regulators or corporate staff?

(BESP XIII)

13-Approximately, what percentage of employees in your facility has received environmental sustainability training over the past twelve months in the following sections?
Training includes environmental sustainability courses or team meetings where environmental sustainability, Discussed or publish actions and effects.

Please check one for each department.

	0-20%	21-40%	41-60%	61-80%	81-100%	No such department at my facility
Management						
Operation						
Maintenance						
Engineering						
Environment, health & safety						
Sales						
Purchasing / Procurement						

(BESP XIV)

14-In job performance reviews for employees at your facility, how important do you consider the contribution of your employees to environmental sustainability performance?

Please check one for each department. Use your best estimate if you are unsure.

	Not part of review	Low importance	Moderate importance	Important	Very important	No such department at my facility
Management						
Operation						
Maintenance						
Engineering						
Environment, health & safety						
Sales						

Purchasing / Procurement						
-----------------------------	--	--	--	--	--	--

Section C. Environmental Impact

(CEI XV)

15- What is the status of your participation in industry-led environmental programs such as Responsible Care, industry climate challenge programs, etc

(CEI XVI)

16- Approximately how many complaints has your facility received from the surrounding community about odors, noise, smoke, dust, effluents, water pollution, or aesthetic appearance in the last three years?

(CEI XVII)

17- To what extent have each of the following groups influenced your facility to improve its environmental sustainability performance?

	No influence	Little influenc e	Some influenc e	Strong influenc e	Very strong influence
Customers	☐	☐	☐	☐	☐
Suppliers	☐	☐	☐	☐	☐
Competitors	☐	☐	☐	☐	☐
Trade associations	☐	☐	☐	☐	☐
Local community	☐	☐	☐	☐	☐
Socially responsible investment funds	☐	☐	☐	☐	☐
Environmental organizations	☐	☐	☐	☐	☐
Media	☐	☐	☐	☐	☐
Shareholders	☐	☐	☐	☐	☐
Corporate management	☐	☐	☐	☐	☐
Employees	☐	☐	☐	☐	☐
Other facilities within company	☐	☐	☐	☐	☐
Regulators/legislators	☐	☐	☐	☐	☐

(CEI XVIII)

18- To what extent have the following corporate departments influenced your facility to improve its environmental

check one for each department:

	No influence	Little influence	Some influence	Strong influence	Very strong influence	corporation does not have such department
Corporate environmental sustainability management	☐	☐	☐	☐	☐	☐
Corporate legal & regulatory affairs	☐	☐	☐	☐	☐	☐
Corporate strategy	☐	☐	☐	☐	☐	☐
(Corporate public relations	☐	☐	☐	☐	☐	☐
Corporate marketing	☐	☐	☐	☐	☐	☐
Corporate product design	☐	☐	☐	☐	☐	☐

Other (please specify):

(CEI XIX)

To what extent are your facility's environmental
sustainability costs identified in cost accounting?

(CEI XX)

Which of the following issues are significant environmental sustainability issues at your facility?

Air emissions	
Water pollution	
Solid Waste	
Hazardous Waste	

Noise	
Other, please describe	

(CEI XXI)

19- For which of these environmental sustainability issues do you have objectives and targets?

Air emissions	
Water pollution	
Solid Waste	
Hazardous Waste	
Noise	
Other, please describe	

Section D. Motivations for environmental sustainability

(DMFES XXII)

20- In addition to improving environmental sustainability performance, how important are the factors listed below in motivating your facility to implement environmental sustainability management practices?

Not

	important	Somewh important at	Important	Very important
Increase customer loyalty	☐	☐	☐	☐
Reach new customers	☐	☐	☐	☐
Improve employee motivation or morale	☐	☐	☐	☐
Help generate new products or services	☐	☐	☐	☐
Improve regulatory compliance	☐	☐	☐	☐
Influence pending legislation or regulations	☐	☐	☐	☐
Improve relations with environmental non-profit organizations	☐	☐	☐	☐
Improve relations with our local community	☐	☐	☐	☐

(DMFES XXIII)

21- Please describe your company's main business strategy using the following scale, from "provide low cost products or services"

(1) to "differentiate our products" (7)?

	1	2	3	4	5	6	7	
Provide low cost products or services	☐	☐	☐	☐	☐	☐	☐	Differentiate our products on the market

(DMFES XXIV)

22- Please provide any comments and suggestions here:

Thank you for taking the time to complete this questionnaire. Your responses will be valuable in helping me to understand the impact of integrating sustainable environmental development into project management practices of private sector companies in the Kingdom of Saudi Arabia on environmental impact.

I appreciate your willingness to share your thoughts and experiences on this important topic. Your feedback will help me to develop a better understanding of the challenges and opportunities facing companies in Saudi Arabia as they strive to become more sustainable.

Thank you again for your participation.

Midocean University

College of Management

Department of Project Management



Title in English

The Impact of integrating sustainable environmental development into project management practices of private sector companies in the Kingdom of Saudi Arabia on environmental impact

Prepared by:

Asmaa Abdulaal (the leader) – 221000485

Jasim Alnami (member) _ 221001606

Jasim Al-eskait (member) _ 20222005600

Supervised by:

Dr.Walid Soliman

Year:

Second semester 2023